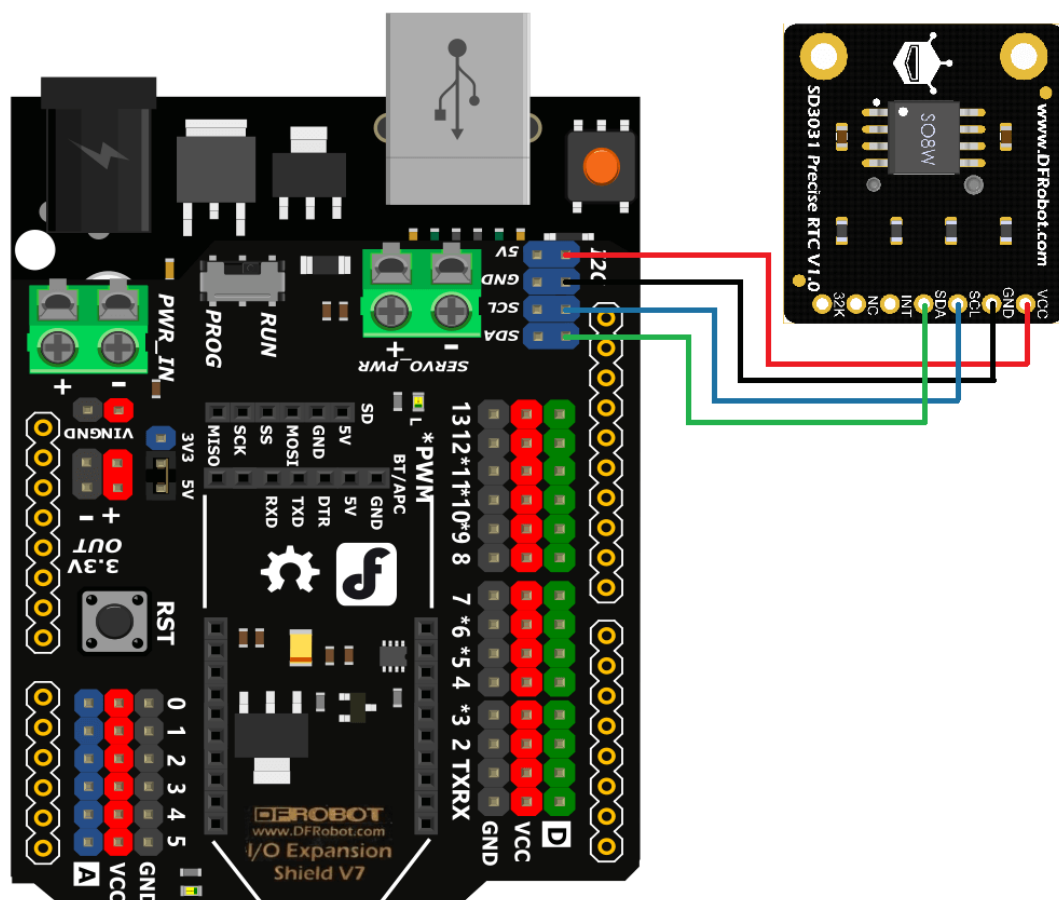


## Introduction

This real-time clock (RTC) module uses the SD3031 chip, which has an integrated crystal oscillator and temperature compensator. This provides high-precision timing and stability. At a temperature of 25 °C, the accuracy is maintained at  $\pm 3.8\text{ppm}$  ( $\pm 0.32832$  seconds/day).

The SD3031 can be powered by button-cell batteries. This allows for accurate timing even when the main power source is interrupted. The RTC keeps track of seconds, minutes, hours, days of the week, dates of the month, and months and years. It also automatically adjusts the date at the end of each month and includes leap year corrections. The SD3031 has a built-in 70-byte SRAM for low-power data storage.

Please note that due to recent air cargo regulations, special items such as batteries, magnets, and liquids are strictly audited for air transport. As a result, the RTC module does not come with batteries. You will need to purchase them locally. The button cell model that is compatible with this module is the CR1220.



Wiring diagram of Fermion: SD3031 Precision RTC Module and Arduino Uno

## Selection Guide

RTC Module Selection Guide				
Product Name	Fermion: DS3231M MEMS Precise RTC (Breakout)	Fermion: DS3231 Precise RTC (Breakout)	Fermion: DS3232 Precise RTC (Breakout)	Fermion: SD3031 Precision RTC Module for Arduino (Breakout)
Figure				
SKU	DFR0641	DFR0819	DFR0821	DFR0998
Storage	None	None	236Byte	70Byte
Integrated Resonator	MEMS	XTAL	XTAL	XTAL
Timing Current	2000nA	840nA	1500nA	1800nA
Timing Precision	±5ppm (±0.432s/d)	±3.5ppm (±0.3024s/d)	±3.5ppm (±0.3024s/d)	±3.8ppm (0.32832s/d) @ 25°C
Operating Voltage	3.3V-5.5V	3.3V-5.5V	3.3V-5.5V	3.3V
Operating Temperature	-45°C to 85°C	-40°C to 85°C	-40°C to 85°C	-10°C to 70°C
Introduction	A real-time clock (RTC) module with integrated MEMS resonator, reducing the risk of mechanical failure, suitable for scenarios with strong and frequent vibration.	A real-time clock (RTC) module with integrated crystal oscillator, featuring higher precision and lower power consumption, suitable for scenarios requiring high precision and low power.	A real-time clock (RTC) module with integrated crystal oscillator, featuring built-in 236Byte SRAM storage, capable of storing data with ultra-low power consumption, suitable for low-power IoT applications requiring real-time clock.	A cost-effective RTC module with integrated crystal oscillator, featuring built-in 70Byte SRAM storage, capable of storing data with ultra-low power consumption, suitable for low-power IoT applications requiring real-time clock.

## Features

Low power consumption, operating current of only 1.8μA when powered by button cell battery

High precision, ±3.8ppm@25°C

Integrated temperature compensator, small temperature drift

Readable button cell voltage

Built-in 70Byte SRAM

## Applications

Event Reminder

Countdown Devices

MCU External Wake-up Source

Clock & Alarm Output

IoT Data Collection & Storage

## Specification

Supply Voltage: 3.3V

I2C Address: 0x32

SRAM: 70 Byte (0x2C-0x71)

Timing Year Range: 2000 - 2099

Operating Temperature: -10°C to +70°C

Timing Accuracy:  $\pm 3.8\text{ppm}$  @ 25°C

Dimension: 22.5x21mm/0.89x0.83"

## Documents

[Product wiki](#)

[Schematics](#)

## Shipping List

Fermion: SD3031 RTC module (Breakout) × 1

2.54-7P Black Single-row Pin Connector × 1